

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)



REC'D 19 APR 2005

WIPO PCT

Applicant's or agent's file reference 3FPO-09-06	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/KR2003/002293	International filing date (day/month/year) 29 OCTOBER 2003 (29.10.2003)	Priority date (day/month/year) 19 NOVEMBER 2002 (19.11.2002)
International Patent Classification (IPC) or national classification and IPC IPC7 C12M 3/00		
Applicant KOREA INSTITUTE OF SCIENCE AND TECHNOLOGY et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:
- I ☒ Basis of the report
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 25 MAY 2004 (25.05.2004)	Date of completion of this report 31 MARCH 2005 (31.03.2005)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer WON, Jong Hyeok Telephone No. 82-42-481-5592 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/KR2003/002293

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☒ the description:
pages 1-12, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☒ the claims:
pages 13-16, as originally filed
pages _____, as amended (together with any statement) under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☒ the drawings:
pages 1/7-7/7, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

- These elements were available or furnished to this Authority in the following language English which is
- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☒ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-10	YES
	Claims	None	NO
Inventive step (IS)	Claims	1-10	YES
	Claims	None	NO
Industrial applicability (IA)	Claims	1-10	YES
	Claims	None	NO

2. Citations and explanations (Rule 70.7)

The following documents identified in the International Search Report have been considered for this report:

D1 : US 6048723 A (Flexcell Int. Corp.)

D2 : US 6057150 A (Bio-Rad Lab. Inc.)

D3 : JP 10-155475 A (Takekasa Toru)

Claim 1 of the present application relates to a hybrid bioreactor for cell culture comprising a plurality of reactor tube assemblies; a compressive strain motor; a ball screw coupled to be operated in conjunction with the compressive strain motor; an upper anchor; a lower anchor; a shear strain motor; and power transmitting means.

Claim 4 of the present application relates to a hybrid bioreactor for cell culture comprising a compressive strain motor; a main support; an upper compressing means; lower anchoring means; a shear strain motor; rotating means; a plurality of reactor tube assemblies.

D1, which is considered to represent the most relevant state of the art, discloses a flexible bottom culture plate for applying mechanical load to cell cultures. It has a flexible membrane sandwiched between a base and a body.

D2 discloses biological cells plated on an elastic membrane are placed under biaxial strain for purposes of observation by a device that includes a support with an opening over which the membrane is secured.

D3 discloses loading device for culturing cell using a silicone membrane formed into a belt-like shape. In this invention, two rods are inserted in the interior of the silicone belt having cells and are hung on right and left arms respectively.

The subject matter of claims 1 and 4 differs from the disclosure of D1 to D3 mainly in that this application provides a hybrid bioreactor including a compressive strain motor and compressing means applying to the cells compressive strain and shear strain to promote the proliferation and differentiation.

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Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of:

Box V.

None of the documents D1 to D3 teach or fairly suggest such a hybrid bioreactor that provides the mechanical stimulus for the cells as disclosed in claims 1 and 4 of the present invention. It cannot be considered obvious to a person skilled in the art to be able to apply complex mechanical stimuli, including compressive strain and shear strain like the present invention in order to promote the proliferation and differentiation, with knowledge of the cited documents.

Therefore, claims 1 and 4 of the present application are considered to meet the requirements of Article 33(2) and 33(3) PCT.

The subject matter of claims 2-3 and 5-10, which is dependent on claim 1 and 4 respectively, also meet the requirements of Article 33(2) and 33(3) PCT.

The subject matter of claims 1-10 is considered to be industrially applicable under Article 33(4) PCT.